Using remote-sensing and other decision-support tools produced by the San Francisco Estuary Institute

Bruce Wolfe, Executive Officer

SF Bay Regional Water Board

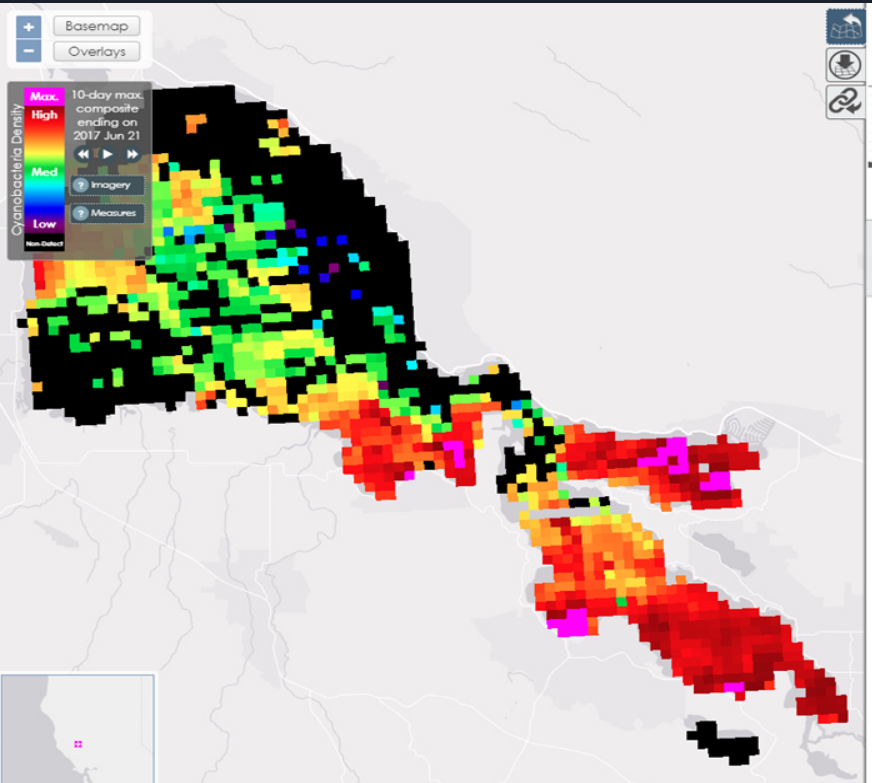
The Evolution of Monitoring

- Point Source Monitoring
- Water Quality Objectives: watershed-based monitoring
- Regional Monitoring - and the SF Bay RMP is 25 this year!
- Modeling
- Remote-sensing – satellites and UAVs/drones

Freshwater Harmful Algal Blooms: Detection, Notification, and Analysis

cchab.sfei.org

Freshwater Harmful Algal Blooms: Detection and Notification



Freshwater Harmful Algal Blooms: Detection and Notification

- Project developed by the California Cyanobacterial Harmful Algal Blooms Workgroup, SWAMP, and State Board
- European Space Agency satellite imagery and NOAA image processing algorithms
- SFEI presents imagery and derived information via an interactive map
- Also notifies Water Boards with any new bloom detections
- Funded by U.S. EPA via State Board

GreenPlan-IT: Resources for planning, optimizing, and tracking Green Infrastructure

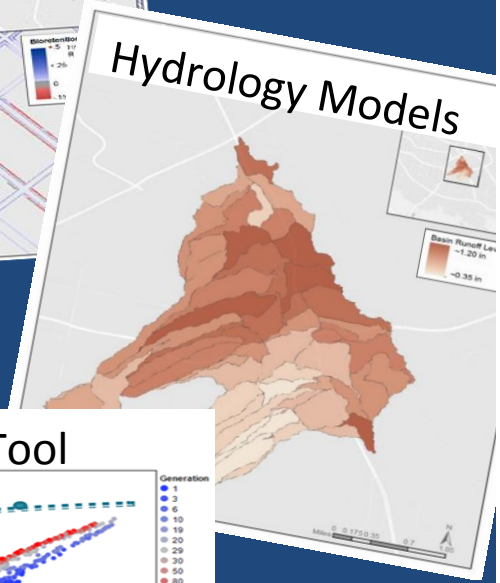
greenplanit.sfei.org

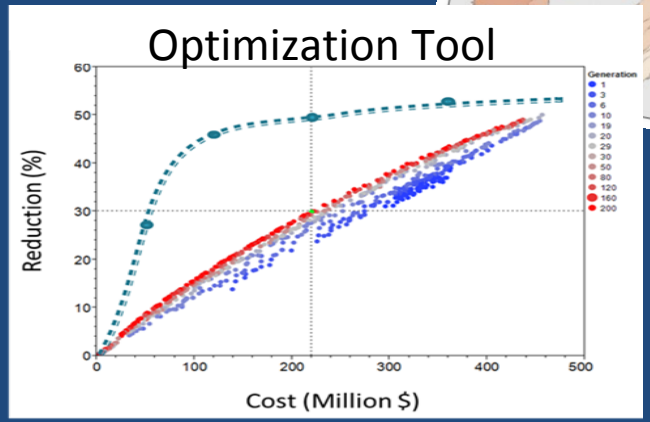
GreenPlan-IT

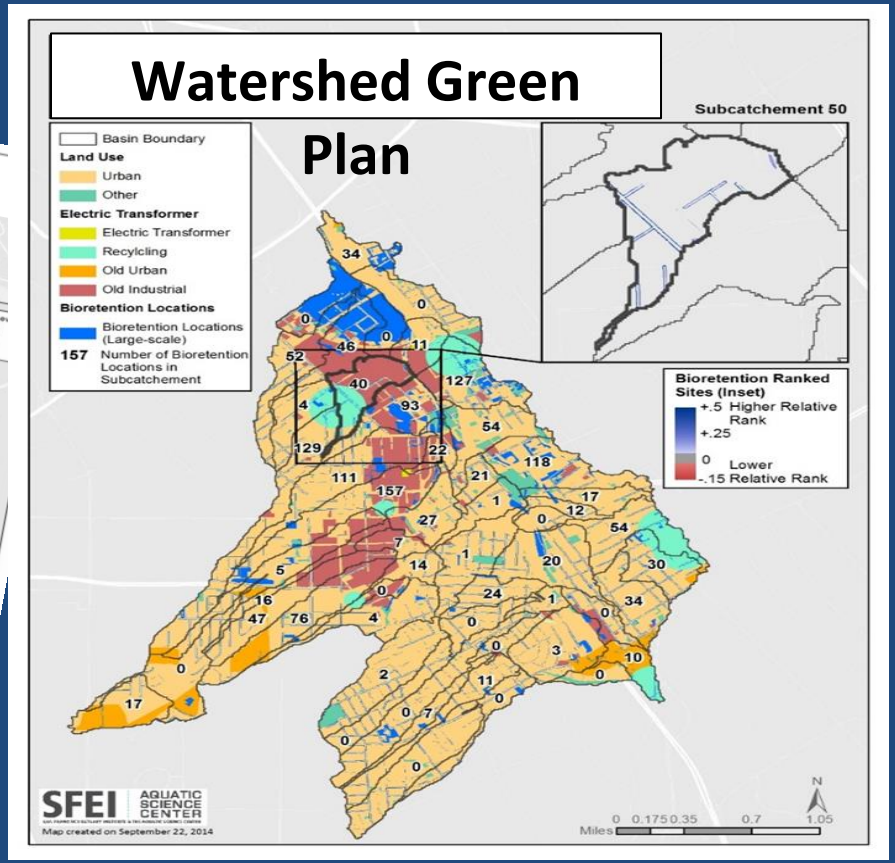
LID Site Suitability Tool, Hydrology Models, Optimization Tool, Tracker Tool

- Uses local and regional data (transportation, storm water infrastructure, CARI, land use, etc.)
- Generates ranked LID Location Opportunity Map
- Incorporates cost factors, hydrology, and pollutant load models
- Generates optimal watershed-based Green Plan and tracks progress toward goals
- Funded by State Board and U.S. EPA

Example GreenPlan-IT Output







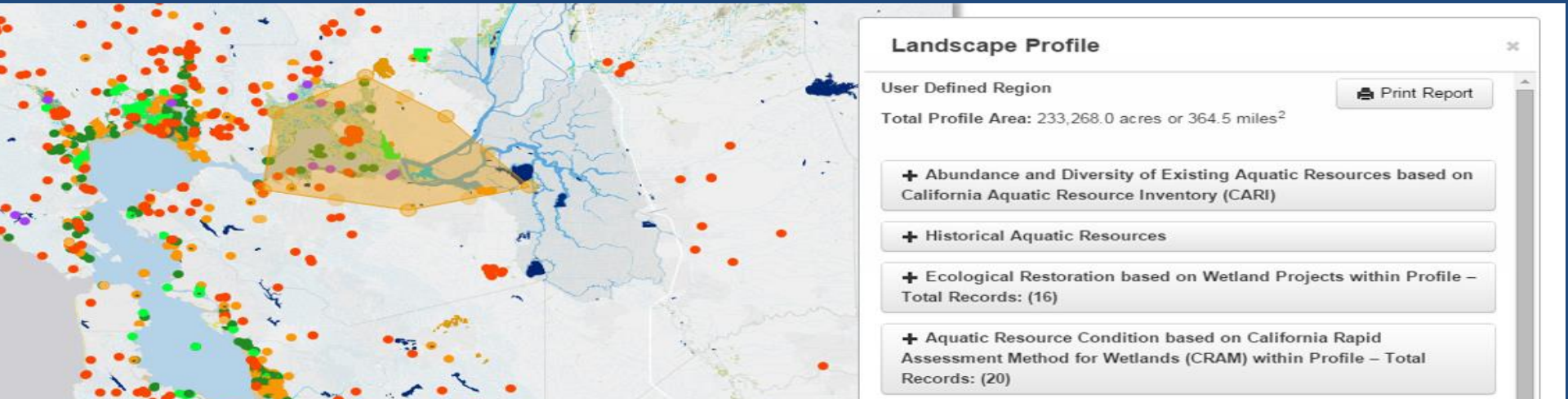
CARI: California Aquatic Resources Inventory

EcoAtlas: Visualizing and Tracking CA's Aquatic Resources

ecoatlas.org

Landscape Profile Tool

- Abundance and diversity of aquatic resources and other information plotted for user-defined watersheds (derived from **remotely sensed information** via the California Aquatic Resources Inventory)
- Generates custom maps, graphs, and tables as automated PDF that can be downloaded
- Current focus is on 401/WDR but program-specific versions are possible (stormwater, TMDLs, THP, HCP/NCCP, etc.)



Landscape Profiles

Landscape Profile

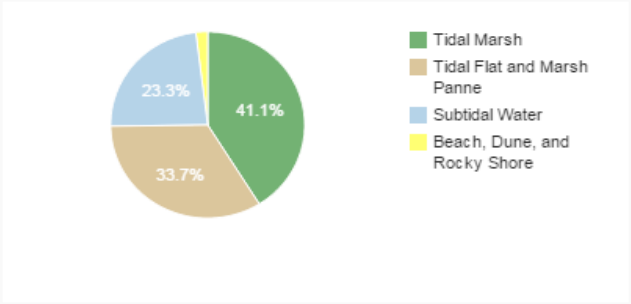
User Defined Region

Print Report

Total Profile Area: 472,774.0 acres or 738.7 miles^2

– Abundance and Diversity of Existing Aquatic Resources based on California Aquatic Resource Inventory (CARI)

Marine and Estuarine Resources: 460 acres / 0.7 miles^2



Palustrine Resources: 10,953 acres / 17.1 miles^2

Landscape Profile

– Historical Aquatic Resources

Estuarine and Marine: *No historical estuarine or marine resources found*
Palustrine: *No historical palustrine wetlands or terrestrial features found*

+ Ecological Restoration based on Wetland Projects within Profile – Total Records: (9)

+ Aquatic Resource Condition based on California Rapid Assessment Method for Wetlands (CRAM) within Profile – Total Records: (36)

+ Human Population based on 2010 Census

+ Species of Special Status based on CNDDB Species Information

+ Developed Land Cover by NLCD 2011 Category

View data source details

RipZET: A GIS-based Tool for Estimating Riparian Zones

sfei.org/ripzet

RipZET: Overview

Purpose

Estimate riparian zone width based on desired function and watershed location

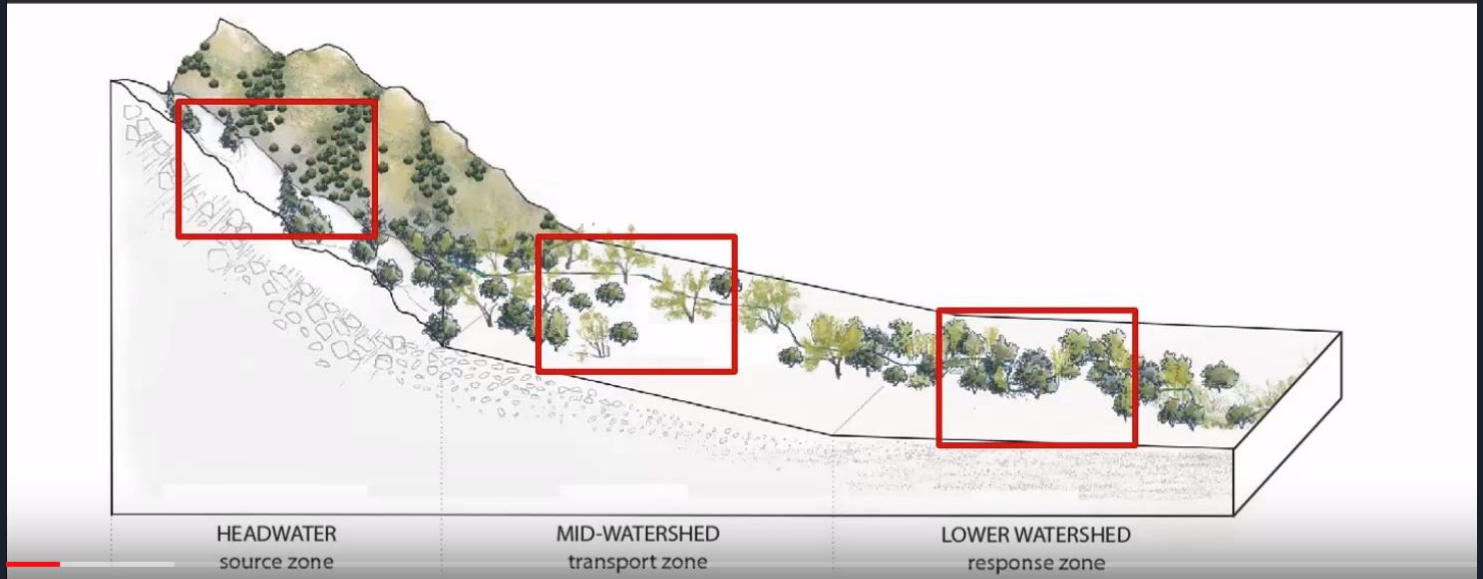


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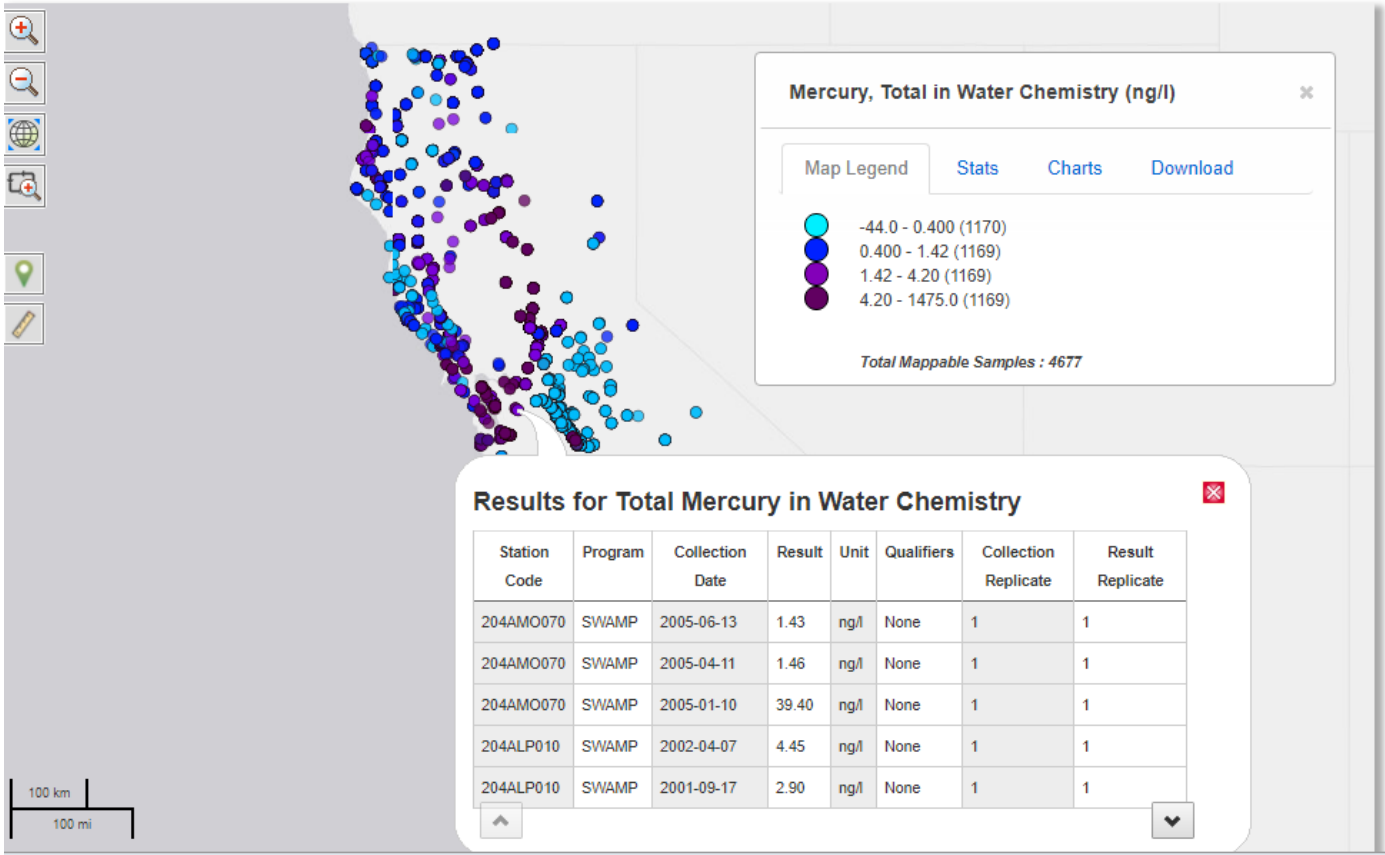
Image by Jen Natali

CD3: Contaminant Data Display and Download Tool

cd3.sfei.org

CONTAMINANT DATA
DISPLAY & DOWNLOAD



Results for Total Mercury in Water Chemistry

Station Code	Program	Collection Date	Result	Unit	Qualifiers	Collection Replicate	Result Replicate
204AMO070	SWAMP	2005-06-13	1.43	ng/l	None	1	1
204AMO070	SWAMP	2005-04-11	1.46	ng/l	None	1	1
204AMO070	SWAMP	2005-01-10	39.40	ng/l	None	1	1
204ALP010	SWAMP	2002-04-07	4.45	ng/l	None	1	1
204ALP010	SWAMP	2001-09-17	2.90	ng/l	None	1	1

Select Contaminant Data

Water Chemistry

Select an Analyte Group

Mercury

Total

ng/l

Select a Program

Select a Project

Share link to CD3 data selection.

Filter by Area of Interest

Refine by Sample Year

Set Map Layer Style:

Quartiles

Resilience Atlas: An interactive map for adaptation information and resilient strategies

resilienceatlas.sfei.org

Resilience Atlas

RESILIENCE ATLAS

accessible science for creating resilient landscapes

SHORELINE CHARACTERISTICS | INFRASTRUCTURE | VULNERABILITY | ADAPTATION | ALL DATA

ABOUT // DOWNLOADS | RESILIENCE ATLAS | SFEI

- New tool features data regarding resilience, adaptation strategies, and vulnerability to various impacts
- Hosts new Bayshore Inventory, assembled via remote sensing
- Goal is to aid regional planning efforts by providing access to an online repository of key datasets related to ecosystem resilience around the Bay shore to restoration managers, governmental agencies, nonprofits, and citizens.
- Tool funded by Bay Area Integrated Regional Water Management (IRWM) program, managed by the San Francisco Estuary Partnership (SFEP)

Statewide Standards for Trash Monitoring Methods: Collaborative project with SCCWRP

www.sccwrp.org/ResearchAreas/MarineDebris.aspx

Statewide Standards for Trash Monitoring Methods

3 years • 2017-2020

- **Funder:**
  - Ocean Protection Council
- **Project Leads:**
  - Southern California Coastal Water Research Project (SCCWRP)
  - San Francisco Estuary Institute (SFEI)
- **Partner Agency:**
  - State Water Board

Project Goals

- Develop a library of standard trash monitoring methods, usable by a broad range of stakeholders, through field testing, research, and outreach
- Determine the accuracy and precision possible via innovative new methods, such as through use of UAVs, artificial intelligence, and other remote sensing techniques
- Promote greater consistency in monitoring results across the State

Thank you!

Bruce Wolfe

bruce.wolfe@waterboards.ca.gov